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U. S. DEPT. OF AGRICULTURE
NATIONAL FERTILIZER BOARD

MAY 14 1965
FERTILIZER RECORDS

**THE
FERTILIZER
SITUATION
1964 - 1965**

A report from the Defense Activities Staff prepared by
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THE FERTILIZER SITUATION FOR 1964-65

General Situation

Net U. S. supplies of fertilizer materials for 1964-65 are expected to total 11,891,000 tons of plant nutrients: nitrogen (N), phosphate (P_2O_5) and potash (K_2O). This would be an increase of 7 percent over a year ago and 51 percent over four years ago.

Each of the three primary plant nutrients has been reported to be in tight supply since July 1, the beginning of the current fertilizer year (July 1 - June 30). Increased world-wide demand eliminated surplus stocks and is currently keeping pace with expanded production. Delays in construction schedules and difficulties in sustaining full production are also factors contributing to the tight supply situation.

Opportunities to export materials exert pressure on available supplies. Domestic producers can find foreign markets for their production to a point just short of creating shortages in the U. S. market. Anticipated exports may have to be reduced before the season ends in order to meet domestic requirements. Commitments to supply a substantial quantity of materials for the Agency for International Development (AID) program have contributed toward eliminating domestic inventories of ammonium sulfate.

Expected gains in 1964-65 supplies are dependent on movement of fertilizers during the rush season. Transportation and handling facilities must operate at maximum capacity during this period to provide enough fertilizers to satisfy anticipated needs for farmers. Farmers may not be able to obtain their first-choice product but should be able to procure satisfactory forms of nitrogen, phosphate or potash in quantities sufficient to meet their plant nutrient requirements.

Estimates presented in this report are based on trends shown by published production and inventory data for the first six months (July-December) of the fertilizer year and foreign trade statistics, supplemented by information from the industry.

Nitrogen (N)

Net domestic supplies of nitrogenous fertilizer materials for 1964-65 will reach a record level of 5,091,000 tons of nitrogen (N), an increase of 11 percent over 1963-64 (table 1). Total nitrogen supply from domestic sources will be up 17 percent but the expected foreign trade balance will reduce this to a net gain of 11 percent.

Production - Production of anhydrous ammonia each month during the first six months of the current fertilizer year was higher than ever before for that month of the year. May has been the peak month for the past three years, but production in December 1964 even exceeded production

Table 1. -- NITROGEN: Estimated supply of nitrogen for fertilizer purposes, 1963-64 and 1964-65, United States and possessions

(1,000 short tons of N)

Item	1963-64 <u>1/</u>	1964-65
<u>Supply from domestic sources</u>		
Solids:		
Ammonium nitrate <u>2/</u>	615	683
Ammonium sulfate <u>2/</u>	405	569
Urea	232	265
All other solids	487	561
Total solids	1,739	2,078
Liquids:		
Ammonia (including aqua)	1,531	1,727
All other	1,148	1,373
Total liquids	2,679	3,100
Total (solids and liquids)	4,418	5,178
<u>Imports</u>		
Ammonium nitrate	73	65
Ammonium sulfate	48	33
Urea <u>2/</u>	101	94
Ammonium nitrate-limestone mixtures	10	5
Sodium nitrate	64	52
Ammonia (including aqua)	74	103
Nitrogen solutions	25	25
All other	58	52
Total	453	429
<u>Exports</u>		
Ammonium nitrate	13	47
Ammonium sulfate	87	127
Urea	20	11
Ammonia (including aqua)	67	92
All other	77	239
Total	264	516
NET DOMESTIC SUPPLY	4,607	5,091

1/ Revised

2/ Adjusted for estimated quantity going into non-fertilizer uses.

in May 1964 by 40,000 tons. Anhydrous ammonia for direct application and formulation of mixed fertilizers will be up 13 percent. Nitrogen solutions may increase as much as 20 percent.

Total solid nitrogen materials are expected to be up 20 percent. Ammonium sulfate will be up 40 percent with other solid nitrogen materials registering gains ranging from 11 to 15 percent.

Imports - Imports of nitrogen will decrease 5 percent from last year's volume. Anhydrous ammonia is the only nitrogen product expected to be above the previous year. The indicated decline in imports of other nitrogenous materials is probably a reflection of the world supply-demand situation for nitrogen.

Exports - Exports of nitrogenous materials are expected to be double those of last year despite urea exports being down about one-half last year's volume. The increase will be in ammonium nitrate, ammonium sulfate, anhydrous ammonia and miscellaneous nitrogen materials other than urea.

Nitrogen capacities - Anhydrous ammonia capacity is estimated to have been 8,585,000 tons of NH_3 on January 1, 1965. This compares with 1,700,000 on January 1, 1951 and 4,750,000 tons on January 1, 1958. Anhydrous ammonia capacity in 1967 is expected to be double that in 1964 (table 2). These data are based on capacities and construction schedules available from published information. The average capacity of plants which came on stream in 1964 was 108,800 tons per year. Plants scheduled to come on stream in 1966 will average 316,700 tons of anhydrous ammonia per year.

Table 2. -- Estimated anhydrous ammonia plant capacity, including scheduled construction
(1,000 tons)

	1964		1965		1966		1967	
	No.	NH_3	No.	NH_3	No.	NH_3	No.	NH_3
	Plants:		Plants:		Plants:		Plants:	
Capacity Jan. 1	74	7,497	84	8,585	91	11,181	103	14,981
On stream during year	10	1,088	7	2,596	12	3,800	?	?

Performance indicates the industry can currently produce other nitrogen products in the following annual quantities:

Solid fertilizer-grade ammonium nitrate	2,717,000 tons
Ammonium sulfate other than coke-oven	1,785,000 "
Nitrogen solutions (N basis)	1,507,000 "
Urea (total for all uses)	1,413,000 "

Phosphates (P₂O₅)

Net domestic supplies of phosphates for fertilizers in 1964-65 are expected to total 3,718,000 tons of P₂O₅, 5 percent more than 1963-64 (table 3).

Normal and enriched superphosphate - The supply of normal and enriched superphosphate will decline 2 percent unless the production trend is reversed by the tight supply situation for concentrated sources of P₂O₅. Imports of these materials are negligible. Exports are likely to be about double those in 1963-64.

Concentrated superphosphate - Concentrated superphosphate supplies are expected to be up 18 percent over a year ago. Supplies increased last year 200,000 tons of P₂O₅ above the expected level because of shifts in production away from other concentrated P₂O₅ materials. Imports are expected to be up 25 percent. Exports will be 14 percent above last year.

Ammonium phosphates - In the recent past ammonium phosphate supplies have not increased at the rate generally projected for them. The total quantity available this year will be 18 percent more than last year. It would be more if producers had enough captive or contracted ammonia available to support ammonium phosphate production at planned levels. Imports will be 25 percent below last year. Exports are expected to be up 70 percent.

Supplies of wet-process and furnace phosphoric acid for direct application and for formulation of dry and liquid mixed fertilizers will be down 7 percent from last year. Furnace acid for fertilizer use is reported to be in especially short supply.

Ammonium phosphates for direct application - Consumption of selected grades of ammonium phosphates for direct application increased 15.5 percent from 1962 to 1963 (table 4). Ammonium phosphates, as the term is commonly used, include monoammonium and diammonium phosphates, mixtures of the two or combinations with ammonium nitrate and/or ammonium sulfate. The biggest gains were made by 16-48-0, 18-46-0 and 30-10-0. Ammonium phosphates are used also in bulk blending, in ammoniators and by manufacturers who add potash to produce mixtures containing all three primary nutrients.

Not all grades of ammonium phosphate are listed in Table 4. Others are made, some of which are more difficult to delineate from available data because the same N-P grades are produced by combining N and P₂O₅ source materials other than anhydrous ammonia and phosphoric acid. Some quantities of grades listed may even have been manufactured by other than the ammonium phosphate process.

Phosphate capacities - Production of normal and enriched superphosphate was reported to the Bureau of the Census by 187 plants in 1963, nine fewer than in 1962. This reduced the capacity of producing plants to an estimated 2,772,000 tons of P₂O₅. The quantity produced in 1963 was about 44 percent of estimated capacity.

Table 3. -- PHOSPHATE: Estimated supply of P_2O_5 for fertilizer purposes
1963-64 and 1964-65, United States and possessions

(1,000 short tons of available P_2O_5)

Item	1963-64 <u>1/</u>	1964-65
<u>Supply from domestic sources</u>		
Normal and enriched superphosphate	1,235	1,209
Concentrated superphosphate	1,262	1,495
Ammonium phosphate <u>2/</u>	844	993
All other <u>3/</u>	505	483
Total	<u>3,846</u>	<u>4,180</u>
<u>Imports</u>		
Concentrated superphosphate	24	30
Ammonium phosphate	32	24
All other	<u>44</u>	<u>46</u>
Total	<u>100</u>	<u>100</u>
<u>Exports</u>		
Normal superphosphate	31	63
Concentrated superphosphate	267	304
Ammonium phosphate	82	139
All other	<u>20</u>	<u>56</u>
Total	<u>400</u>	<u>562</u>
NET DOMESTIC SUPPLY	3,546	3,718

1/ Revised.

2/ Liquid and solid ammonium phosphate shipped as such by primary producers.

3/ Includes ammonium phosphate (produced in combination with potash salts to make mixed fertilizers), nitric phosphates, sodium phosphate, wet base goods, calcium metaphosphate, natural organics, phosphate rock and colloidal phosphate, basic slag, and estimates of wet and furnace phosphoric acid for liquid and solid mixed fertilizers and direct application.

Table 4. -- U. S. consumption of selected grades of ammonium phosphate for direct application

Grade	Fertilizer year					
	1957-58	1958-59	1959-60	1960-61	1961-62	1962-63
	(s.t.)	(s.t.)	(s.t.)	(s.t.)	(s.t.)	(s.t.)
11-48-0	83,066	103,518	116,383	134,104	138,669	147,287
13-39-0	45,476	52,010	51,186	49,088	39,604	29,862
16-20-0	295,015	336,759	378,335	405,749	463,551	485,282
27-14-0	17,683	20,334	24,778	30,156	37,666	41,268
21-53-0	27,413	26,980	30,881	33,272	39,068	29,743
16-48-0	19,571	28,824	53,959	100,935	151,455	201,756
18-46-0		644	20,388	32,680	81,253	175,312
23-23-0		8,001	12,910	18,763	19,079	19,124
24-20-0	8,062	12,237	13,822	29,047	20,319	16,299
30-10-0	1,259	10,620	13,601	17,245	35,599	52,440
18-36-0		9,299	11,875	9,732	10,625	
Total	497,545	609,226	728,118	860,771	1,036,888	1,198,373
N content	78,227	97,550	117,973	141,516	173,660	202,997
P ₂ O ₅	144,747	177,300	217,977	265,355	326,608	391,330

Source: "Consumption of Commercial Fertilizers and Primary Plant Nutrients in the United States," Agricultural Research Service, U. S. Department of Agriculture. Nitrogen and phosphate content calculated.

Concentrated superphosphate capacity is estimated to be about 1.7 million tons of P_2O_5 . This is exclusive of ability to produce the material in some normal superphosphate plants or in facilities allocated to ammonium phosphate manufacture. Plants newly announced will add about 300,000 tons of P_2O_5 .

Ammonium phosphate capacity is estimated to be about 1.5 million tons of P_2O_5 . New plants announced, plants under construction and expansion of existing plants will add about 1.2 million more tons of P_2O_5 .

Wet-process phosphoric acid capacity has increased from 1,348,000 tons of P_2O_5 January 1, 1960, to an estimated 2,984,000 on stream in March 1965, an increase of 121 percent. New plants announced, plants under construction and expansions will add close to 1.5 million more tons within the next eighteen months.

Potash (K_2O)

Net domestic supplies of potash for fertilizers in 1964-65 are estimated to total 3,082,000 tons of K_2O , an increase of 5 percent over 1963-64 (table 5).

Table 5. -- POTASH: Estimated supply of K_2O for fertilizer purposes, 1963-64 and 1964-65, United States and possessions

(1,000 short tons of K_2O)

Item	1963-64 <u>1/</u>	1964-65
<u>Supply from domestic sources</u>		
Potassium chloride	2,571	2,685
Potassium sulfate <u>2/</u>	158	195
All other	35	35
Total	2,764	2,915
<u>Imports</u>		
Potassium chloride	626	831
Potassium sulfate <u>2/</u>	47	32
All other	18	14
Total	691	877
<u>Exports</u>		
Potassium chloride	483	608
Potassium sulfate <u>2/</u>	25	51
All other	18	51
Total	526	710
NET DOMESTIC SUPPLY	2,929	3,082

1/ Revised.

2/ Includes potassium-magnesium sulfate.

Domestic deliveries of potassium chloride will be up more than 4 percent over last year. Forward bookings were brisk at the beginning of the fertilizer year in anticipation that the tight supply situation would not improve. Producers have not been able to build inventories for the spring rush and several expect to be unable to accept spot orders after the rush begins.

Imports from Canada are expected to be increased 63 percent over last year. A second Canadian plant started production in September 1964 and a third plant is expected to make some contribution to the current year's supply.

Reduction in forward bookings of potash from France and Spain were reported at the beginning of this fertilizer year. French production has been limited by regulations on disposal of waste salts. Spanish mine production has been cut by strike, technical machinery and mining problems. German exports to the United States are also expected to be down. Demand has increased until the tight supply situation has become world-wide. Total imports from Europe are expected to be 20 percent less than in 1963-64. Some tonnage of potash is expected from a new plant in Israel but it will have little influence upon the U. S. market.

Exports of potassium chloride are expected to increase about 26 percent over a year ago.

Potassium sulfate and potassium magnesium sulfate supplies are expected to be up about 23 percent over 1963-64. Imports will drop 22 percent from last year. Exports during the first six months of the fertilizer year were three times larger than last year, and the total for the year will be at least double exports of last year.

Potash capacities - Effective domestic potash capacity is estimated to be about 3,075,000 tons of K₂O. Shipment was started at a new facility in Utah in January 1965 and will require time to bring production up to designed capacity. Another new facility in New Mexico is expected to start production in September 1965 but will also take time to reach full capacity. Several companies are actively exploring for potash. Explorations include interest in geothermal brine deposits in the Salton Sea area of California, deposits in Utah and a new area of exploration in Arizona.

Two companies are now producing potash in Canada and a third facility is expected on stream this spring. Four additional companies have announced plans for construction of production facilities in Canada. If projected construction plans materialize, Canada's potash capacity will exceed expanded capacity in the United States before 1975.

Foreign Trade in Fertilizers

Imports of urea more than doubled from 1962 to 1964 (table 6). The points of entry are indicated roughly by the customs districts. Country of origin is given in Table 7. Indications are that about 78 percent of the imported urea is being used for fertilizer, the rest for feed supplement and industrial uses.

Canada continues to be the major source of imported fertilizers and fertilizer materials (table 7). Tonnages of potash from Canada will be larger than last year and are likely to show a steady growth as more U. S. firms start up potash facilities in Canada. Importation of lower analysis fertilizer materials is declining in volume. Imports of ammonium nitrate-limestone mixtures are declining but slackening of imports is partially owing to increased production on the part of domestic producers.

Products exported in large volume in 1963-64 were ammonium sulfate, concentrated superphosphate, phosphate rock and potash (table 8). Exports of nitrogenous materials, potash, ammonium phosphates and mixed fertilizers were brisk during the first six months of the current year. Procurement for programs of the Agency for International Development (AID) added to the increased activity in ammonium sulfate and ammonium phosphates.

India, South Viet-Nam and South Korea, countries with active AID programs, took 84 percent of U. S. ammonium sulfate exports in 1963-64. These countries took 60 percent of the exported urea, 41 percent concentrated superphosphate, 45 percent of ammonium phosphates, 25 percent of mixed fertilizers and 8 percent of potassium chloride.

Mexico took 85 percent of U. S. exports of anhydrous ammonia and 46 percent of ammonium nitrate. Japan took 28 percent of the Florida phosphate rock and 46 percent of the potassium chloride.

Table 6. -- U. S. imports of urea by customs districts

(Short tons of material)

Customs district	: 1961-62	: 1962-63	: 1963-64
01-Maine & New Hampshire	: 296	: 485	: 50
02-Vermont	: 9,794	: 10,472	: 9,006
04-Massachusetts	: 790	: 893	: 1,292
07-St. Lawrence	: 557	: 570	: 590
09-Buffalo	: 20,949	: 29,895	: 22,332
10-New York	: 2,311	: 2,205	: 12,943
11-Philadelphia	: 953	: 744	: 2,481
13-Maryland	: 15	: 1,129	: 816
14-Virginia	: 992	: 11,250	: 26,378
15-North Carolina	: 5,520	: 8,761	: 6,813
16-South Carolina	: 350	: 60	: 20
17-Georgia	: 8,665	: 12,120	: 180
18-Florida	: 1,292	: 2,156	: 13,636
19-Mobile	: --	: 9,740	: 45
20-New Orleans	: 523	: --	: 84
22-Galveston	: 1,290	: 4,057	: 10,701
23-Laredo	: --	: --	: 300
25-San Diego	: 1,206	: 627	: 150
27-Los Angeles	: 5,521	: 7,810	: 16,512
28-San Francisco	: 7,238	: 12,914	: 12,639
29-Oregon	: 15,919	: 21,770	: 15,248
30-Washington	: 7,594	: 10,680	: 36,754
31-Alaska	: 22	: 50	: --
32-Hawaii	: 20,897	: 30,232	: 27,910
33-Montana & Idaho	: 3,937	: 4,202	: 26,104
34-Dakota	: --	: --	: 957
36-Duluth	: --	: 885	: 3,524
38-Michigan	: 11,793	: 12,532	: 24,419
39-Chicago	: --	: 48	: 130
43-Tennessee	: --	: 43	: --
49-Puerto Rico	: 8,453	: 14,556	: 8,402
Total	: 137,296	: 213,886	: 280,416

Table 7. -- U. S. imports of selected fertilizer materials by country of origin, 1963-64 1/
(Short tons of material)

Country of origin	Ammonium : sulfate	Ammonium : nitrate	Ammonium : 32% & less	Calcium : nitrate	Urea	Anhydrous : ammonia	Phosphate : crude	Potassium : chloride	Potassium : sulfate	Potassium : sodium	Other : fertilizer
Canada	176,479	491		101	115,475	10,120	185	666,535		164	25,768
Mexico					44		12,887				3,603
Trinidad	3,009				14,950	60,142					
Netherlands Antilles		11,200			2,050	20,489	117,745				
Venezuela	4,505				424		12,275				
British Guiana					140					23,439	165
Chile											
Norway				28,033	35,760			601	314		
Netherlands	2,155	34,000		12,800	24,122			32,371	3,939		
Belgium	2,094			23,642				162,050	36,646	20	3,777
France				8,779				147,708	33,613	70	16,082
West Germany	33,332	3,858		14,067	16,578			34,228	15,487		
Spain										5,120	
Italy				22,835							100
Japan	6,010			10,879			3,640				
French Pacific Islands							13,330				
OWAF							27,694				
Togo											
Other	120				4,738	52					3,072
TOTAL	227,704	49,549		55,001	280,416	90,803	187,756	1,043,493	94,628	28,813	52,567

1/ Other materials imported, mainly from Canada, were the following: 217,735 tons of ammonium nitrate over 32%, 82,042 tons of nitrogen solutions, 28,320 tons of calcium cyanamide, 106,564 tons of ammonium phosphates, 146,052 tons of mixed fertilizers, 74,579 tons of phosphatic fertilizers and fertilizer materials and 15 tons of basic; also 396,958 tons of nitrate of soda from Chile. Other products were 3,872 tons of manures, including guano; 5,965 tons of potassium nitrate and 18,798 tons of other nitrogenous fertilizers and fertilizer materials.

Table 8. -- U. S. exports of selected fertilizer materials by destination, 1963-64 1/

(Short tons of material)

Country of destination	: Anhydrous:		: Ammonium:		: Urea:		: Phosphate:		: Normal:		: Concentrated:		: Potassium:		: Ammonium:		: Mixed:	
	: sulfate:	: ammonia:	: nitrate:	: nitrate:	: nitrate:	: nitrate:	: rock (all):	: phosphate:	: super-:	: phosphate:	: super-:	: phosphate:	: chloride:	: phosphate:	: phosphate:	: phosphate:	: fertilizers:	: fertilizers:
Canada	3,612	4,001	3,111	4,303	1,224,443	127,256	59,843	41,624	18,795	1,511								
Mexico	340	69,338	17,986	5,649	240,755	93	5,140	32,156	6,290	464								
El Salvador		3		2,142	8,051		4,579	5,851	881	9,024								
Nicaragua	50	12	125	1,580		100	474	100	1,556	12,540								
Costa Rica	1,102	4,150			6,140	773	2,395	15,024	17,598	3,566								
Central America, Other	91	6	124	1,775		30	1,209	2,035	6,134	7,073								
West Indies, British	7,613		270	120	1,438	964	1,077	750	125	11,845								
West Indies, Other	17,679	116	94	309	4,231	1,082	2,007	14,780	9,637	4,199								
Columbia			80	551	22,904	10,437	10,437	25,109	1,352	32,028								
Venezuela	43	95	1,766	43	1,107	2,238	2,238	1,152	67	2,617								
Peru			4,111	4	17,987	33	33	339	2,168	1,941								
Chile		14	2,500			83,603	83,603	10,631	200									
Brazil	13,769			45	117,580	1,366	60,498	25,445	22									
South America, Other	3,792	3	1,226	269	6,578	1,571	2,551	818	7,167	11,131								
Sweden					44,916		3,310	4,410										
Norway		3,500			12,710													
Denmark					11,455													
United Kingdom					276,364	51		847		71								
Ireland								9,912	23,332									
Netherlands					61,503													
Belgium					36,993			1,092		15								
France				150	18,834			8,879	9,770	41								
West Germany					572,422			4,300		3								
East Germany																		
Spain	9,802			5	127,035													
Italy	54			50	799,339													
Greece				120														
Europe, Other					8,574													
India																		
Viet-Nam	238,802			26,565	44,719	35												
Malaysia	88,617				1,151,618													
Phil. Rep.				20	33,588													
Korea	4																	
Taiwan	19,316			392														
Japan																		
Asia, Other																		
Australia	6,164			1,652														
New Zealand	6			4,708														
Oceania, Other				153														
Republic of South Africa	1,145			10														
Africa, Other	1,444	305	261	511														
TOTAL	413,451	81,543	39,173	44,446	6,663,973	154,289	579,391	804,779	274,291	164,881								

1/ Other materials exported were: 1,794 tons of nitrate of soda, 45,847 tons of nitrogenous chemical fertilizer materials, n.e.c. 26,879 tons of nitrogenous organic waste, n.e.c., 11,518 tons of phosphatic fertilizer materials, n.e.c., 50,943 tons of potassic fertilizer materials, n.e.c.

References to current fertilizer data

Nitrogen production

1. Current Industrial Reports, Inorganic Chemicals, Series M28A Bureau of the Census, U. S. Department of Commerce.
2. Preliminary Report on U. S. Production of Selected Synthetic Organic Chemicals, S.O.C. Series C (a monthly report); and Synthetic Organic Chemicals - United States Production and Sales (an annual report), Chemical Division, U. S. Tariff Commission (for urea).
3. Coke and Coal Chemicals, Monthly Coke Report, Mineral Industry Surveys, Bureau of Mines, U. S. Department of the Interior.
4. Nitrogen, The Magazine of World Nitrogen, The British Sulphur Corporation Ltd., 43 Great Titchfield Street, London, W. 1, England.

Phosphate production

1. Current Industrial Reports, Superphosphate and other Phosphatic Fertilizer Materials, Series M28D, Bureau of the Census, U. S. Department of Commerce.
2. Current Industrial Reports, Inorganic Chemicals, Series M28A, Bureau of the Census, U. S. Department of Commerce (for phosphoric acid).
3. Phosphate Rock, Mineral Market Reports, Mineral Industry Surveys, Bureau of Mines, U. S. Department of the Interior.

Potash production

1. Potash, Mineral Market Reports, Mineral Industry Surveys, Bureau of Mines, U. S. Department of the Interior.
2. Press releases, American Potash Institute, Inc., 1102 Sixteenth St., N. W., Washington 6, D. C.

Foreign trade

1. U. S. Imports of Merchandise for Consumption, Report No. FT 110. U. S. Exports of Domestic and Foreign Merchandise, Report No. FT 410; both FT 110 and FT 410 are reports of the Foreign Trade Division, Bureau of the Census, U. S. Department of Commerce.

Fertilizer consumption

1. Annual fertilizer consumption reports, U. S. Fertilizer Laboratory, Soil and Water Conservation Research Division, ARS-USDA, Beltsville, Maryland.

World production, consumption and trade

1. Fertilizers in Europe - Production, Consumption, Prices and Trade, Organization for Economic Cooperation and Development, Paris.
2. Fertilizers - An Annual Review of Production, Consumption and Trade Food and Agriculture Organization of United Nations.

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SITUATION,

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NITROGEN, PHOSPHATE

POTASH X

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Stabilization and Conservation Service
Washington, D.C.

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A report from the Defense Activities Staff prepared by
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THE FERTILIZER SITUATION FOR 1965-66 1/

General Situation

Net U. S. supplies of fertilizer materials for 1965-66 will total 13,428,000 tons of the primary plant nutrients -- nitrogen (N), phosphate (P_2O_5) and potash (K_2O). This is 15 percent more than last year. The 1965-66 supply is double that of eight years ago.

Net supplies of nitrogenous materials will total about 5,645,000 tons of N, up 14 percent from last year; phosphatic materials about 4,461,000 tons of P_2O_5 , up 22 percent; and potash for fertilizers about 3,222,000 tons of K_2O , up 10 percent.

Supplies are assumed to be enough to relieve the tight situation of the past two or three years. However, industry reports that some spot orders cannot be filled. Some materials are reported to be in short supply due largely to their being preferred by mixers, bulk blenders and farmers.

Foreign trade data are expected to show that the United States is still a net importer of nitrogenous and potassic materials and a net exporter of phosphatic materials.

Phosphate rock and potassium chloride are the only materials exported in larger quantities than last year except materials for which requirements of the Agency for International Development (AID) are sizeable. Delayed scheduling of shipments precludes marked increases in exports in this fertilizer year. An exception is ammonium sulfate shipped mainly to India. Industry is showing a more active interest in foreign markets for fertilizers.

The "spring rush" is the climax to the fertilizer year, -- a crucial period for the fertilizer industry trying to supply farmers. The prevailing spring weather conditions have a major influence on fertilizer demand. The shortage of boxcars may adversely affect industry's ability to deliver the heavy volume of fertilizers needed during the rush season.

Supply estimates in this report are based on trends in production and inventory data for July through December only, on foreign trade statistics for the same period, and on supplemental information from the industry. The estimates for nitrogen will be low if some of the large ammonia plants nearing completion get into full production for 60 to 90 days before the end of this fertilizer year. In previous years the start-up of new plants after the first half of the fertilizer year did not seriously affect these estimates because new plant size was small compared with total existing capacity.

1/ The fertilizer year is from July through June 30.

Nitrogen (N)

Supplies of nitrogenous materials for domestic fertilizer use in 1965-66 will total 5,645,000 tons of nitrogen (N), an increase of 14 percent over last year (table 1). Total nitrogen supply from domestic sources will be up about 16 percent. Even with marked increases in anhydrous ammonia production, the U. S. continues to be a net importer of nitrogen, imports exceeding exports by 21,000 tons.

Production -- Total production of anhydrous ammonia in 1965-66 will be about 9.4 million tons, 50 percent more than only three years ago. Production records were broken each successive month, October through December, 1965, over the previous record in May 1965.

Anhydrous ammonia for direct application and formulation of mixed fertilizers will be up about 15 percent over last year. Supplies of nitrogen solutions are up about 10 percent.

Solid ammonium nitrate supplies are expected to increase about 4 percent. Ammonium sulfate supplies will be up about 38 percent. Solid urea will increase about 19 percent. Other solid nitrogenous materials will increase about 24 percent, largely as ammonium phosphates.

Imports -- Imports of nitrogen will be about 503,000 tons of N, 7 percent more than last year. The indicated increases in ammonia, sodium nitrate and "all other" nitrogenous materials will more than offset decreases in ammonium sulfate and urea.

Exports -- Total nitrogen exports are expected to be 482,000 tons of N, up 20 percent over 1964-65. Exports of ammonium sulfate are expected to be about double those of last year. Out-movement of all other nitrogenous materials is lagging behind the previous year, as much as 47 percent behind in the case of urea.

Nitrogen capacities -- Anhydrous ammonia capacity on January 1, 1966, is estimated at 11,059,000 tons of NH_3 , an increase of 2.3 million tons during the last year. It is expected to be 17.9 million tons by 1968, double that on January 1, 1965 (table 2). These estimates are based on published capacities and construction schedules.

Table 1. -- NITROGEN: Estimated supply of nitrogen for fertilizer purposes, United States and possessions, 1964-65 and 1965-66

(1,000 short tons of N)

Item	1964-65 <u>1/</u>	1965-66
<u>Supply from domestic production</u>		
Solids:		
Ammonium nitrate <u>2/</u>	653	679
Ammonium sulfate <u>2/</u>	455	629
Urea	259	309
All other solids <u>3/</u>	456	566
Total solids	1,823	2,183
Liquids:		
Ammonia (including aqua)	1,835	2,114
All other	1,212	1,327
Total liquids	3,047	3,441
Total (solids and liquids)	4,870	5,624
<u>Imports</u>		
Ammonium nitrate	60	59
Ammonium sulfate	40	33
Urea <u>2/</u>	88	73
Sodium nitrate	59	61
Ammonia (including aqua)	146	178
Nitrogen solutions	22	22
All other	55	77
Total	470	503
<u>Exports</u>		
Ammonium nitrate	39	30
Ammonium sulfate	135	270
Urea	19	10
Ammonia (including aqua)	102	96
All other	97	76
Total	392	482
NET DOMESTIC SUPPLY	4,948	5,645

1/ Revised.

2/ Adjusted for estimated quantity going into non-fertilizer uses.

3/ To avoid duplication the figure for "all other solids" has been adjusted by the estimated amount of imported ammonia used in primary materials.

Table 2. Anhydrous ammonia capacity: Number of plants and estimated production capacity, in thousands of tons of ammonia, on January 1, by calendar years, 1965-68

	1965		1966		1967		1968	
	: No.		: No.		: No.		: No.	
	: Plants	NH ₃	: Plants	NH ₃	: Plants	NH ₃	: Plants	NH ₃
Capacity Jan. 1	: 84	8,776	: 89	11,059	: 105	15,217	: 111	17,884
Start-up during year:	:		:		:		:	
Expansions	: 17)		: 8)		: 1)		: 1)	
New plants	: 5)	2,283	: 16)	4,158	: 6)	2,667	: 6)	
	:		:		:		:	

The trend is toward larger anhydrous ammonia plants. Size of earlier plants was increased by adding units or trains. About the time the first single-train 600 tons per day ammonia plant with centrifugal compressors started producing, a contract was awarded for the construction of a 1000 tons per day single-train plant. The first 1000-ton plant started producing near the beginning of 1966, and now ten others are scheduled. The first 1500 tons per day single-train plant was contracted in the fall of 1965, and three others have since been announced.

Production performance indicated the industry has the capacity to produce annually other nitrogen products as follows:

Nitric acid (total for all uses)	5,356,000 tons
Solid fertilizer grade ammonium nitrate	2,707,000 "
Ammonium sulfate other than coke-oven	2,143,000 "
Nitrogen solutions (N basis)	1,768,000 "
Urea (total all uses)	1,517,000 "

Phosphates (P₂O₅)

The growth in concentrated phosphatic fertilizer materials is phenomenal. Net domestic supplies of P₂O₅ in 1965-66 are expected to total 4,461,000 tons, about 22 percent more than in 1964-65 (table 3). Exports of P₂O₅ will be about 2.5 times imports.

Superphosphates -- The supply of normal and enriched superphosphate will decline about 3 percent from last year. Imports of these materials are negligible. Exports are expected to be less than one-half what they were in 1964-65.

Concentrated superphosphate supplies will be 20 percent more than last year. Imports are expected to be off 12 percent. Exports are lagging 20 percent behind last year.

Table 3. -- PHOSPHATE: Estimated supply of P_2O_5 for fertilizer purposes, United States and possessions, 1964-65 and 1965-66

(1,000 short tons of available P_2O_5)

Item	1964-65 <u>1/</u>	1965-66
<u>Supply from domestic production</u>		
Normal and enriched superphosphate	1,142	1,110
Concentrated superphosphate	1,316	1,576
Ammonium phosphate <u>2/</u>	1,031	1,322
All other <u>3/</u>	513	659
Total	4,002	4,667
<u>Imports</u>		
Concentrated superphosphate	19	17
Ammonium phosphate	33	82
All other	46	45
Total	98	144
<u>Exports</u>		
Normal superphosphate	26	12
Concentrated superphosphate	269	215
Ammonium phosphate	111	112
All other	26	11
Total	432	350
NET DOMESTIC SUPPLY	3,668	4,461

1/ Revised.

2/ Liquid and solid ammonium phosphate.

3/ Includes nitric phosphates, sodium phosphate, wet base goods, calcium metaphosphate, natural organics, phosphate rock and colloidal phosphate, basic slag, and estimates of wet and furnace phosphoric acid for liquid and solid mixed fertilizers and direct application.

Ammonium phosphates -- Ammonium phosphate supplies are expected to be 28 percent above last year, reflecting recent increases in production capability. Imports, primarily from Canada, are expected to more than double those of last year, while exports will be about the same as last year.

Phosphoric acid -- Production of wet-process phosphoric acid, a basic raw material for manufacture of concentrated superphosphate and ammonium phosphates, is about 30 percent ahead of last year. This increase has not yet been fully reflected in the production of concentrated solid phosphatic fertilizer materials. Part of the increase could be in liquid mixed fertilizers made from materials produced with superphosphoric acid. Superphosphoric acid is becoming a significant part of the concentrated P_2O_5 supply, but data are not available to show the extent of this development. Furnace phosphoric acid, used as a fertilizer primarily in liquid mixed fertilizers, is reported to be in especially short supply again this year.

Direct application of ammonium phosphates -- Direct application of selected grades of ammonium phosphates increased 18 percent from 1962-63 to 1963-64, the last year for which data are available (table 4). Gross tonnage increased from 497,545 tons in 1957-58 to 1,439,182 tons in 1963-64. The 16-20-0 grade has had a steady growth. More dramatic increases have been in 16-48-0 and 18-46-0 grades.

Ammonium phosphates, as the term is commonly used, includes monoammonium and diammonium phosphates, mixtures of the two or combinations with ammonium nitrate and/or ammonium sulfate. In addition to direct application, they are used in bulk blending and in mixing operations to produce grades containing all three primary plant nutrients.

The grades listed in Table 4 are not all-inclusive. N-P grades can be produced by mixing N and P_2O_5 source materials other than anhydrous ammonia and phosphoric acid, or by chemical processes.

Phosphate capacities -- Normal superphosphate capacity has not been estimated. The number of normal superphosphate plants reporting to the Bureau of the Census reached a peak in 1955 (table 5). Production declined 5 percent from 1958 to 1964 while the number of producing plants was 17 percent less.

Concentrated superphosphate capacity is estimated to be 1,754,000 tons of P_2O_5 . This capacity excludes some normal superphosphate plants and facilities allocated to ammonium phosphate manufacture. Plants newly announced or under construction will add about 532,000 tons of P_2O_5 by 1968.

Ammonium phosphate capacity is about 2.5 million tons of P_2O_5 . New plants announced, plants under construction and expansion of existing plants will add 603,000 tons of P_2O_5 by 1968. Many plants can produce either concentrated superphosphate or ammonium phosphates. Therefore, market requirements can change the type of product manufactured and thus change classification of a plant.

Table 4. -- Ammonium phosphates: U. S. consumption of selected grades for direct application, alternate years 1957-58 through 1963-64

(Short tons)

Grade	Fertilizer year					
	1957-58	1959-60	1961-62	1963-64		
11-48-0	83,066	116,383	138,669	162,594		
13-39-0	45,476	51,186	39,604	21,123		
16-20-0	295,015	378,335	463,551	515,922		
27-14-0	17,683	24,778	37,666	33,775		
21-53-0	27,413	30,881	39,068	32,007		
16-48-0	19,571	53,959	151,455	188,667		
18-46-0		20,388	81,253	338,571		
23-23-0		12,910	19,079	18,276		
24-20-0	8,062	13,822	20,319	16,149		
30-10-0	1,259	13,601	35,599	68,745		
18-36-0		11,875	10,625			
29-14-0				32,587		
11-37-0				10,766		
Total	497,545	728,118	1,036,888	1,439,182		
N content	78,227	117,973	173,660	249,486		
P ₂ O ₅	144,747	217,977	326,608	480,316		

Source: "Consumption of Commercial Fertilizers and Primary Plant Nutrients in the United States," Agricultural Research Service, U. S. Department of Agriculture. Nitrogen and phosphate content calculated.

Table 5. -- Normal superphosphate plants: Number in the continental United States reporting to the Bureau of the Census

Year	No. plants	Year	No. plants
1955	218	1960	208
1956	210	1961	198
1957	202	1962	195
1958	211	1963	187
1959	209	1964	181

Wet-process phosphoric acid capacity has increased from 1,348,000 tons of P_2O_5 on January 1, 1960, to an estimated 4,344,000 on January 1, 1966, an increase of 222 percent. Completion of new plants announced but not started, plants under construction, and replacements and expansions will add 1,503,000 more tons by 1968.

Potash (K_2O)

Net domestic supplies of potash for fertilizers in 1965-66 are expected to be 3,322,000 tons of K_2O , an increase of 10 percent over 1964-65 (table 6). Imports of 1,379,000 tons of K_2O are expected to be more than double the amount exported.

Potassium chloride -- Deliveries of muriate of potash from domestic production will be down about 8 percent from last year despite start-up by a new producer during the year. The boxcar shortage may reduce deliveries even more than currently anticipated.

Canada is the most important source of imported K_2O . Imports from there the first half of the year were 872,000 tons of material, . 78 percent above the same period last year. European material is expected to be down slightly from last year.

Exports of potassium chloride are up slightly from 1964-65.

Potassium sulfates -- Deliveries of potassium sulfate and potassium magnesium sulfate are likely to be about the same as a year ago. Imports will be down 23 percent. Exports are expected to be up 13 percent over last year.

Potash capacities -- U. S. potash capacity, as of January 1, 1966, is estimated at 3,600,000 tons of K_2O . Capacity increased about 525,000 tons during last year through expansion of existing facilities and progress toward attaining full production of two new facilities. Several companies are

Table 6. -- POTASH: Estimated supply of K₂O for fertilizer purposes,
United States and possessions, 1964-65 and 1965-66

(1,000 short tons of K₂O)

Item	1964-65 <u>1/</u>	1965-66
<u>Supply from domestic production:</u>		
Potassium chloride	2,527	2,336
Potassium sulfate <u>2/</u>	212	210
All other	35	35
Total	<u>2,774</u>	<u>2,581</u>
<u>Imports</u>		
Potassium chloride	840	1,342
Potassium sulfate <u>2/</u>	28	22
All other	16	15
Total	<u>884</u>	<u>1,379</u>
<u>Exports</u>		
Potassium chloride	537	555
Potassium sulfate <u>2/</u>	64	73
All other	24	10
Total	<u>625</u>	<u>638</u>
NET DOMESTIC SUPPLY	3,033	3,322

1/ Revised.

2/ Includes potassium-magnesium sulfate.

actively exploring for potash. Locations involved are geothermal brine deposits in the Salton Sea area of California, mineral deposits in Utah, a new area in Arizona, an underground lake in Nevada, and expanded extraction from Great Salt Lake in Utah.

Three companies in Canada have an estimated annual capacity of 1,920,000 tons of K_2O . Five additional companies have announced plans to build plants there. If these plans materialize, the eight active companies will have an estimated capacity of 6.8 million tons of K_2O . Twenty other companies are reported to be planning, probing, leasing and/or prospecting for potash in Canada.

Foreign Trade in Fertilizers

Canada is the major source of U. S. fertilizer imports (table 7). Imports of potassium chloride from Canada have reached a level where 39 percent of the net U. S. supply in 1965-66 is expected to be from there. Canada's urea capacity has increased until in 1964-65 over 50 percent of U. S. imports came from there.

Imports of urea in 1964-65 were 34,074 tons less than in the previous year (table 8). The quantity entering through the Vermont, Buffalo, Montana-Idaho and Duluth customs districts was from Canada plus a portion of that through Washington and Hawaii. Country of origin is given in Table 7.

Imports of anhydrous ammonia and potassium chloride show significant increases in 1964-65 over a year earlier (table 9). The increase in anhydrous ammonia is from the Caribbean area primarily for use in Gulf and Atlantic coast finishing plants. The increase in potassium chloride tonnage is from the recently developed Canadian potash deposits.

Exports of ammonium sulfate, phosphate rock, concentrated superphosphate and potassium chloride each were over the one-half million ton level in 1964-65 (table 10), having grown during the last five years (table 11). Ammonium phosphates have tripled in volume in the last three years.

Mexico is an important customer for most of the fertilizers exported by U. S. producers, although Japan is the leading one for phosphate rock and potassium chloride. Countries in Europe took 35.6 percent of the phosphate rock.

Countries with active AID programs, India, Pakistan, South Korea and Viet Nam, took 62 percent of the ammonium sulfate exports in 1964-65. They also got 34 percent of the concentrated superphosphate, 58 percent of ammonium phosphates, 57 percent of mixed fertilizers and 7 percent of potassium chloride. Requirements for AID programs form a large part of U. S. fertilizer exports.

Table 7. -- U. S. imports of selected fertilizer materials by country of origin, 1964-65
(Short tons of material)

Country of origin	: Ammonium :		: Calcium :		: Urea :		: Anhydrous :		: Phosphate :		: Potassium :		: Potassium :		: Other :	
	: sulfate :	: nitrate :	: nitrate :	: nitrate :	: sulfate :	: sulfate :	: ammonia :	: crude :	: chloride :	: sulfate :	: nitrate :	: nitrate :	: nitrate :	: nitrate :	: materials :	: materials :
Canada	189,804	180,018	46	126,593	11,706	2	1,102,873	224							8,758	
Mexico					20,001		50								225	
Trinidad	1,515			17,317	139,496											
Netherlands Antilles				10,571	13,095	93,490										
Chile															10,723	
Brazil					9,229										2,246	
Norway		51	39,176	38,295											41	
Netherlands				9,609												
Belgium				15,219												
France				5,620												
West Germany	1	500	1,090	12,036												
Spain																
Italy				5,512												
Morocco																
Ghana																
Other				5,570	4,221											
Total	192,819	180,069	40,312	246,342	177,747	160,077	1,399,281	56,098	10,723						17,295	

1/ Other materials imported, mainly from Canada, were the following: 73,685 tons of nitrogen solutions, 22,074 tons of calcium cyanamide, 111,579 tons of ammonium phosphates, 160,076 tons of mixed fertilizers, 61,750 tons of phosphatic fertilizers; also 366,363 tons of nitrate of soda from Chile. Other products were 4,813 tons of potassium nitrate and 19,455 of nitrogenous fertilizers and fertilizer materials.

Table 8. -- U. S. imports of urea by customs districts, 1961-62 to 1964-65 inclusive

(Short tons of material)

Customs district	1961-62	1962-63	1963-64	1964-65
01-Maine & New Hampshire	296	485	50	50
02-Vermont	9,794	10,472	9,006	7,886
04-Massachusetts	790	893	1,292	95
07-St. Lawrence	557	570	590	642
09-Buffalo	20,949	29,895	22,332	28,064
10-New York	2,311	2,205	12,943	295
11-Philadelphia	953	744	2,481	2,408
13-Maryland	15	1,129	816	---
14-Virginia	992	11,250	26,378	10,948
15-North Carolina	5,520	8,761	6,813	15,431
16-South Carolina	350	60	20	150
17-Georgia	8,665	12,120	180	9,624
18-Florida	1,292	2,156	13,636	1,322
19-Mobile	---	9,740	45	---
20-New Orleans	523	---	84	220
22-Galveston	1,290	4,057	10,701	565
23-Laredo	---	---	300	---
25-San Diego	1,206	627	150	400
27-Los Angeles	5,521	7,810	16,512	13,715
28-San Francisco	7,238	12,914	12,639	11,470
29-Oregon	15,919	21,770	15,248	13,863
30-Washington	7,594	10,680	36,754	28,562
31-Alaska	22	50	---	---
32-Hawaii	20,897	30,232	27,910	26,943
33-Montana & Idaho	3,937	4,202	26,104	30,581
34-Dakota	---	---	957	309
36-Duluth	---	885	3,524	4,958
38-Michigan	11,793	12,532	24,419	24,721
39-Chicago	---	48	130	---
43-Tennessee	---	43	---	---
49-Puerto Rico	8,453	14,556	8,402	13,120
Total	137,296	213,886	280,416	246,342

Table 9. -- U. S. imports of selected fertilizers, 1960-61 to 1964-65 inclusive

(Short tons of material)

Material	: : 1960-61 : :	: : 1961-62 : :	: : 1962-63 : :	: : 1963-64 : :	: : 1964-65 : :
Ammonium sulfate	: 193,800:	: 269,893:	: 225,553:	: 227,704:	: 192,819
Ammonium nitrate (32% & less)	: 91,110:	: 107,369:	: 65,702:	: 49,549:	: 3
Calcium nitrate	: 77,742:	: 40,895:	: 48,460:	: 55,001:	: 40,312
Urea	: 90,262:	: 136,773:	: 213,886:	: 280,416:	: 246,342
Synthetic nitrogenous material n.e.c.	: 28,135:	: 67,911:	: 60,803:	: 18,798:	: 19,455
Phosphate, crude	: 157,669:	: 128,898:	: 172,230:	: 187,756:	: 160,077
Potassium chloride	: 348,025:	: 330,380:	: 682,864:	: 1,043,303:	: 1,399,281
Potassium sulfate	: 75,963:	: 91,476:	: 117,952:	: 94,628:	: 56,098
Potassium-sodium nitrate	: 20,461:	: 25,751:	: 29,894:	: 29,533:	: 10,723
Nitrogen solutions	: 60,453:	: 74,842:	: 73,559:	: 82,042:	: 73,685
Ammonium nitrate	: 170,753:	: 189,991:	: 254,524:	: 217,735:	: 180,069
Calcium cyanamide	: 43,856:	: 39,754:	: 33,987:	: 28,320:	: 22,074
Sodium nitrate	: 408,246:	: 490,336:	: 378,825:	: 396,958:	: 366,363
Ammonium phosphates	: 102,038:	: 144,930:	: 153,850:	: 106,432:	: 111,579
Mixed fertilizers	: 297,963:	: 267,247:	: 162,184:	: 146,052:	: 160,076
Anhydrous ammonia	: : :	: : :	: : :	: 90,803:	: 177,747

Table 10. -- U. S. exports of selected fertilizer materials by destination, 1964-65
(Short tons of material)

Country of destination	:Ammonium:		:Anhydrous:		Urea	Phosphate: rock (all)	Normal super- phosphate	Concentrated: super- phosphate	Potassium: chloride	Ammonium: phosphates	Mixed fertilizers
	:sulfate:	:ammonia:	:and aqua:	:nitrate:							
Canada	8,010	14,253		1,221	3,860	1,379,207	93,130	32,881	26,582	15,224	4,728
Mexico	30,768	109,078		63,097	20,592	224,935		73	32,335	10,643	6,011
El Salvador	1,003	7		6,000	30	5,410		9,731	6,859	331	10,112
Costa Rica	17				11	10,697	1,032	1,638	12,523	24,080	1,476
Dominican Republic	25,955	18			1,078	7,610		5,710	4,314	2,225	1,771
Central America, Other	176	27		121	3,118	26	55	4,734	2,916	10,694	17,950
West Indies, British	67			447	94	337	860	311	381	334	8,601
West Indies, Other	8,884	32		408	190	5,567		8,749	10,491	4,299	960
Colombia	49			308		24,270		45,770	30,949	11,503	1,130
Venezuela		40		5,183	100	21,808	78	379	220	708	1,727
Peru	39	10		8,054	1,737	19,961			6,007	9	2,420
Chile		24		4,476	309						
Brazil	95,679			441	10	213,439	3,857	94,809	16,393	292	1,435
South America, Other	13,277			547	2,477	17,565	56	51,371	41,375	8,467	7,482
Sweden				105		49,715		5,035	2,789		1
Norway						12,398			19,688		
Denmark						19,190			4,884		5
United Kingdom						276,796			727	7,056	106
Netherlands						67,104		63,422		13,226	4,865
France					101	61,031		22,349		10,239	24
West Germany				20	10	1,016,084	11,200	548	3,145		794
East Germany							19,834				
Spain	48,579					123,558				22	77
Italy					100	870,246		4,300	10,876		5
Europe, Other	315			24	58	20,820		11,421	4,480	1,102	79
India	364,292					23,510			2,571	12,220	59,095
Pakistan	13,083				18			1,471			
Viet Nam	20,817				2,490	22,466		51	1,653	4,231	58,951
Malaysia	2,205	67		100		22,664				93	22
Philippines				470	55	31,188				1,164	684
Korea								196,836	57,573	201,764	5,163
Taiwan									11,575	11,133	
Japan						1,816,125		1,716	366,121	5,473	255
Asia, Other	208	182		1,864	144	995		7,463	2,195	6,678	13,924
Australia	9,999			990	3,254	558,415			46,530	3,348	44
New Zealand				88	258	149,504			120,046	1,510	3,841
Oceania, Other		4								16	98
Republic of South Africa				22,702				13,351	42,805	502	6
Africa, Other	788	327		162	1,768			10	590	326	1,119
Total	644,210	124,069	116,828	41,783	7,072,641	130,102	584,129	895,495	368,912	214,967	

1/ Other materials exported were: 569 tons of nitrate of soda, 47,395 tons of nitrogenous chemical fertilizer materials, n.e.c., 29,906 tons of organic waste, n.e.c., 44,311 tons of phosphatic fertilizer materials, n.e.c., and 128,405 tons of potassic fertilizer materials, n.e.c.

Table 11. -- U. S. exports of selected fertilizers, 1960-61 to 1964-65 inclusive

(Short tons of material)

Material	: 1960-61	: 1961-62	: 1962-63	: 1963-64	: 1964-65
Ammonium sulfate	: 209,167:	: 430,282:	: 485,900:	: 413,451:	: 644,210
Sodium nitrate	: 1,123:	: 1,341:	: 1,499:	: 1,794:	: 569
Anhydrous ammonia	: 87,782:	: 80,515:	: 50,243:	: 81,543:	: 124,069
Ammonium nitrate	: 33,507:	: 37,631:	: 26,764:	: 39,173:	: 116,828
Urea	: 96,621:	: 92,579:	: 24,769:	: 44,446:	: 41,783
Synthetic nitrogenous materials n.e.c.	: 48,519:	: 9,612:	: 9,486:	: 45,847:	: 47,395
Phosphate rock	: 4,465,094:	: 4,689,035:	: 4,930,901:	: 6,663,973:	: 7,072,641
Normal superphosphate	: 140,749:	: 128,782:	: 120,367:	: 154,289:	: 130,102
Concentrated superphosphate	: 361,485:	: 490,499:	: 438,964:	: 579,391:	: 584,129
Potassium chloride	: 760,791:	: 775,147:	: 637,736:	: 804,779:	: 895,495
Potassium sulfates	: 36,774:	: 62,127:	: 35,411:	: 50,943:	: 128,405
Ammonium phosphate	: 118,925:	: 75,715:	: 122,419:	: 274,291:	: 368,912
Mixed fertilizers	: 86,646:	: 73,957:	: 87,656:	: 164,881:	: 214,967

References to current fertilizer data

Nitrogen production

1. Current Industrial Reports, Inorganic Chemicals, Series M28A Bureau of the Census.
2. Preliminary Report on U. S. Production of Selected Synthetic Organic Chemicals, S.O.C. Series C (a monthly report); and Synthetic Organic Chemicals - United States Production and Sales (an annual report), Chemical Division, U. S. Tariff Commission (for urea).
3. Coke and Coal Chemicals, Monthly Coke Report, Mineral Industry Surveys, Bureau of Mines.
4. Nitrogen, The Magazine of World Nitrogen, The British Sulphur Corporation Ltd., 43 Great Titchfield Street, London, W. 1, England.

Phosphate production

1. Current Industrial Reports, Superphosphate and other Phosphatic Fertilizer Materials, Series M28D, Bureau of the Census.
2. Current Industrial Reports, Inorganic Chemicals, Series M28A, Bureau of the Census (for phosphoric acid).
3. Phosphate Rock, Mineral Market Reports, Mineral Industry Surveys, Bureau of Mines.

Potash production

1. Potash, Mineral Market Reports, Mineral Industry Surveys, Bureau of Mines.
2. Press releases, American Potash Institute, Inc., 1102 Sixteenth St., N. W., Washington, D. C. 20036

Foreign trade

1. U. S. Imports of Merchandise for Consumption, Report No. FT 125; U. S. Exports of Domestic and Foreign Merchandise, Report No. FT 410; both FT 125 and FT 410 are reports of the Foreign Trade Division, Bureau of the Census.

Fertilizer consumption

1. Annual fertilizer consumption reports, Statistical Reporting Service, U. S. Department of Agriculture.

World production, consumption and trade

1. Fertilizers - An Annual Review of Production, Consumption and Trade, Food and Agriculture Organization of United Nations.

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